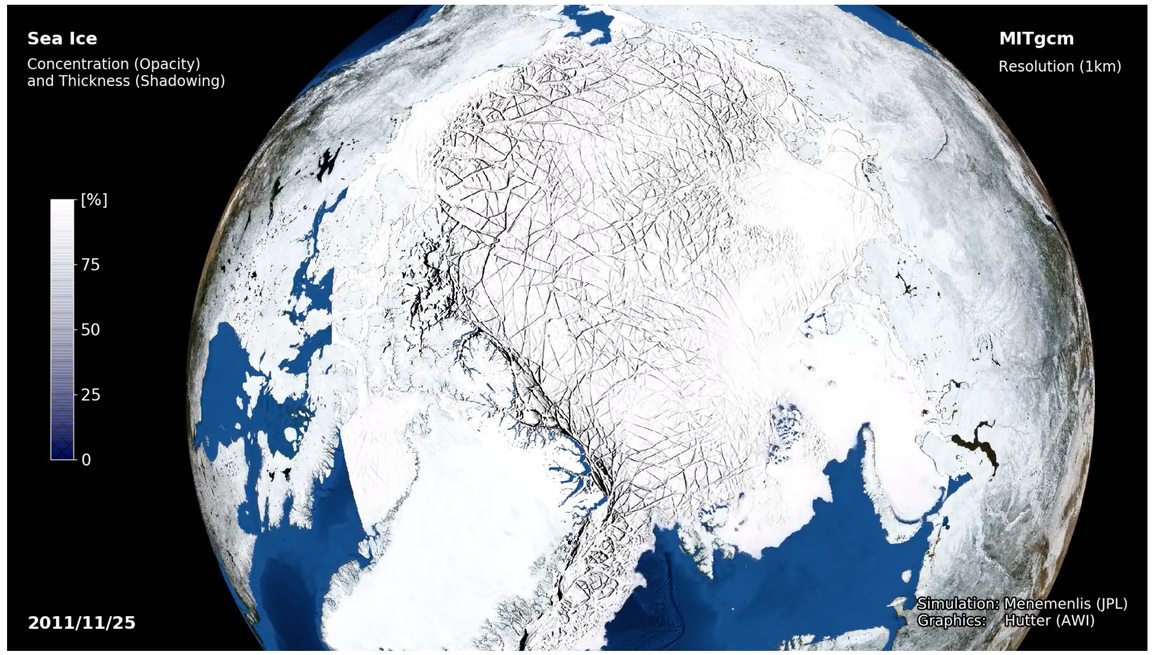
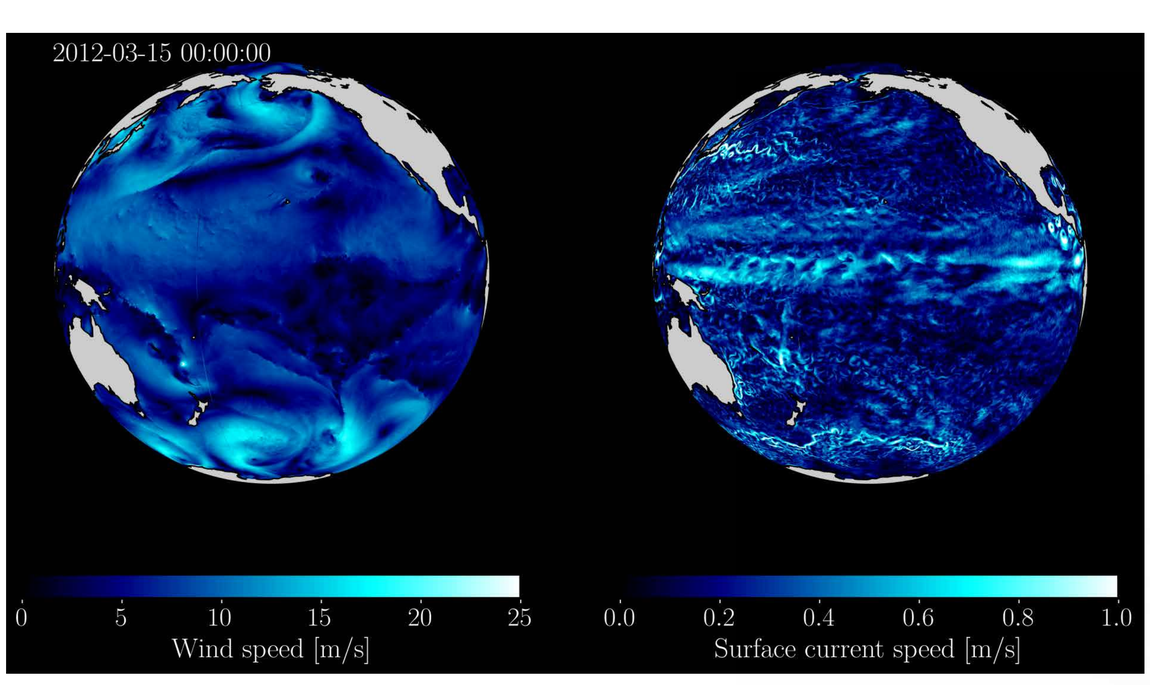


Arctic sea ice concentration and thickness from an internal-wave-admitting Estimating the Circulation and Climate of the Ocean (ECCO) simulation. The small-scale deformation of the ice causes the sea ice cover to be divided into several floes separated by strips of open ocean called "leads." Since many interactive processes between ocean, atmosphere, and ice take place along leads in sea ice, resolving these thin lines improves the representation of air-sea interactions in polar regions. *Dimitris Menemenlis, NASA/JPL; Nils Hutter, Alfred-Wegener Institute*



Snapshots of near-surface wind speed (left panel) and ocean-surface-current speed (right panel) from a coupled GEOS/ECCO numerical simulation. The signature of small-scale oceanic currents (called eddies) can be seen in the larger-scale atmospheric winds. These high-resolution coupled model simulations are advancing NASA capabilities for seamless weather and climate simulation, estimation, and prediction by combining modeling and data assimilation expertise from the GEOS and ECCO teams. *Ehud Strobach, University of Maryland; Andrea Molod, NASA/Goddard*

National Aeronautics and
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Realistic Simulations of the Coupled Atmosphere-Ocean-Ice System

NASA supercomputing is revolutionizing Earth science studies by enabling increasingly realistic numerical simulations of the coupled atmosphere-ocean-ice system. Two flagship NASA data assimilating models, the Goddard Earth Observing System (GEOS) and Estimating the Circulation and Climate of the Ocean (ECCO) have been coupled and are being used to carry out global simulations at unprecedented resolution. These simulations guide understanding of coupled air-sea exchange processes, the parameterization of these processes in coarser-resolution weather and climate models, the utilization of existing satellite observations, and the development of new instruments.

Chris Hill, Massachusetts Institute of Technology
Dimitris Menemenlis, Jet Propulsion Laboratory

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